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STERILITY IN WOMAN.

Causes, Treatment, and Illus-
trative Cases.

BY

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STERILITY IN WOMAN—CAUSES, TREATMENT, AND ILLUSTRATIVE CASES.

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NOTHING is more beautiful than a large family of children. No greater happiness can come to a woman; and that woman is magnificently constituted, who can be the mother of such a family and still retain her health and vigor.

Children, if rightly trained, are a never-ending source of joy and comfort. Even the sound of their breathing at night is a solace sweeter than an angel's whisper; their sleeping faces are volumes of loveliness; their first call in the morning, their exhaustless questions, their thoughts—paraphrases of the mysteries of life; their keen perceptions, their constant playfulness, their never-ceasing activity, their love, their implicit confidences, all make a mother's heart rejoice, and her unspeakable love melt into tenderness; but oh, the weary solemn silence of a home without children, the stillness, the dead depression—nothing is so indescribably sad.

Planted deep in every true woman's heart is this love for children. The sacred penman again and again tells the story: Rebecca was full of sorrow because "she was barren;" the beautiful Rachel said: "Give me children, or I die;" Sarai tells her unutterable sadness in more than human words. Abraham re-echoes her grief, and in deep woe says: "I go childless; behold to me thou hast given no seed." Alone stands that cold and dreary sentence: "Sarai was barren; she had no child." Hannah prayed day and night, was in bitterness of soul and wept sore, wept and did not eat, saying, "If thou wilt give unto thine handmaid a male child!"—and when a son was given no poetry can exceed in exquisite beauty her song of thankfulness. Elizabeth was more than rejoiced when the angel said unto Zacharias: "Fear not; thy prayer is heard, thy wife shall have a son." The withering curse pronounced upon the Kings Jereboam and Ahab was, that their households should be childless; but when the prophet wanted to bless

"the good woman of Shunem" with the best of all riches, it was promised that she should "embrace a son." "She had no child, and her husband was old."

A poor dispensary patient said: "Life was nothing without children." A lady of wealth, now past sixty years of age, still grieves that she has no child on which to lavish the wealth of her love. Women want these blessings. They long for these sweet little birds of Paradise, even though they have no nest, no resting-place, nor any way to make them comfortable;* women of countless wealth would exchange all for the sake of one little child of their own. I have heard the moan from the depths of the human heart. Do we wonder? Alas, alas! they lose life's greatest joy.

Causes of Sterility.—Among the recognized causes of infertility in woman are :

I. *Stenosis of the Os Uteri.*—This in many instances has been the barrier that has prevented happiness, and caused heart-aching disappointment. From a very early period stenosis has been recognized as a cause of sterility. More than four thousand years ago the early Egyptians studied it, and he, who was "learned in all their wisdom," repeatedly speaks of the mouth of the womb being closed, tells how all the wombs of the house of Abimelech were "fast closed." Medical writers of almost every age have referred to it, and eminent surgeons have directed their best efforts to relieve the defect or correct the malformation. Henry von Roonhyse, in his "Medico-Chirurgical Observations," quaintly describes the difficulty, saying: "The neck of the womb is very narrow, hardened, and tapering out, and comes to be shut very close, and even so close that a thin stiletto will not pass into the bottom of the womb; by which infirmity the womb remains shut, the neck comes to be swollen together."

The same writer speaks of a cure by the "violence of the knife;" and in 1650, Joannis Schultetus, in his "Instrumentarium Chirurgicum," pictures a uterotome, copied probably from some prior work, or more ancient record, for, at a very early period surgery was resorted to for relief. In modern times probably the first to popularize surgical procedures for stenosis and flexion was Sir James Y. Simpson, of Edin-

* "Who does not recollect the touching story of the little deformed woman as reported by Dr. I. E. Taylor, at the New York Obstetrical Society. She was four feet four and one-half inches. Five years previously she had been delivered by craniotomy of a child that weighed eleven pounds. Again becoming pregnant, she determined to take whatever risks might be necessary for the sake of having a living child, facing the dangers of a Cæsarian section, even when told her chances were only fifty per cent. We equally admire her desire for children, her dauntless courage, and her more than ordinary heroism."

burgh, and by his bold, bilateral discission of the cervix, he made many cures. When stenosis is combined with anteflexion, the operation suggested by the keen intuition of Marion Sims, viz., "posterior section," will more completely meet all the indications, and is more effectual and safer. The last named writer says that every eighth marriage is sterile. Physicians and surgeons constantly meet with cases that are perplexing and that test all their resources.

Among the first patients who consulted me in my earliest practice were many who came to know why they did not have children. In some I found stenosis of the os, and when, as far as I could then judge, there were no complications, I used bougies, or sponge-tents to dilate. No doubt success in many instances was insured by reducing the inflammation of the cervical mucous membrane, whose somewhat swollen condition possibly obstructed the os and the already diminished caliber of the cervix. One of the most marked cases was Mrs. C——, a beautiful woman, who sought, in 1871, medical aid on account of a persistent sterility. I found stenosis of the external and internal os, the cervix was "narrow, hardened, and tapering out," and there was more or less congestion and inflammation of the endometrium. After reducing the inflammation, I used graduated sponge-tents, keeping each one in about twelve hours, and on removal, swabbed out the whole internal surface of the uterus with a strong carbolic acid solution. The sponge-tents did not cause the least disturbance, and in eleven months thereafter the patient gave birth to a healthy male child.

About the same period I treated another young woman by the sponge-tents, her sterility was cured, and subsequently she gave birth to several children. Soon after, a patient with similar conditions consulted me, but after my best-directed efforts by treatment and by sponge-tents, she remained sterile; the cause, I am now convinced, was a catarrhal salpingitis, sufficient at least to prevent the efficient action of the tubal cilia; still the use of the sponge-tents, with careful antisepsis, promoted drainage, and thereby the patient's local condition and general health were greatly improved.

In 1876 Mrs. R—— consulted me. For many reasons she wanted to bear children. Local medication, while it improved the patient, did not seem to remove the cause of sterility. I requested Professor T. G. Thomas to see the patient. He considered her condition unpromising, yet advised a continuance of the treatment for the uterine catarrh, which I did and, at intervals, used three or four sponge-tents. The patient improved and subsequently became a mother.

Thus, in many instances, I have found sponge-tents have been of valuable service; the temporary pressure has stimulated the endometrium to healthy action, and has had an alterative effect upon the

whole uterus ; * but without care sponge-tents may be a source of grave danger, the fibers of the relaxing and infectious sponge may so penetrate into the yielding mucosa, so bury themselves into the tissues, as to imbed pyogenic gems, and cause serious disturbance, and even dangerous conditions. †

Dilatation of the cervix, whether rapid or gradual, is a much cleaner operation, more surgical, more effective, and safer, and does especial good in that it more successfully promotes drainage, and thereby has a favorable effect upon the uterus and the uterine adnexæ ; ‡ yet if this operation, however simple it may seem, is not done aseptically or antiseptically, it may result most disastrously ; § while, if care-

* The first sponge-tents I used were presented to me by Dr. T. A. Emmet, as he had them prepared for his own use, and in this I was most fortunate. At that time I was studying most assiduously the surgical works and writings of Marion Sims and T. A. Emmet, also was privileged to see Dr. Emmet and other surgeons perform many operations.

† Dr. H. P. C. Wilson says : "I have lost one patient from the use of tents after the greatest antiseptic precautions, and have had a number ill from peritonitis and cellulitis following tents." Dr. T. G. Thomas said : "I have seen several deaths due to the use of sponge-tents. I never use them now, but employed them up to two or three years ago" (Lectures, 1889-90, p. 106).

Marion Sims said in 1887 : "Pelvic cellulitis is more frequently produced by a sponge or laminaria-tent than by anything else."

Dr. Robert Barnes, of London, says : "Numerous cases have occurred of pelvic cellulitis or peritonitis, and some of septicæmia, from the use of sponge-tents.

Dr. L. G. Harrison said in the New York Obstetrical Society, February 3, 1891 : "Before the time of antiseptics the use of sponge-tents was frequently followed by a parametritis, as I have had frequent opportunity of observing. In cases in which septic peritonitis follows the employment of tents, the patient usually died" (*American Journal of Obstetrics*, April, 1891).

Gill Wylie said, in the *Medical Record*, July 25, 1891, "he was satisfied that the use of sponge-tents was a more dangerous practice than the performance of laparotomy."

‡ Professor Gill Wylie performs it frequently and successfully. Dr. Goode reported on one occasion that he had done it three hundred and nineteen times. Dr. Moore Madden's paper at the last International Congress favors it for obstructive dysmenorrhœa.

Dr. Charles Melgs Wilson wrote me, September 6, 1890 : "My father believed in gradual dilatation of the uterus instead of rapid dilatation, or, as he sometimes used to call it, 'divulsion of the uterus.' For the cure of dysmenorrhœa, the relief of sterility, and for intra-uterine applications, I almost universally employ this method. The results have always been satisfactory, and I have never met with an accident. I have done considerably over five hundred."

Dr. Elwood Wilson has performed this operation over five thousand times without unfavorable results.

§ Dr. T. G. Thomas said, in 1886 : "Dilatation should be practised with antiseptic precautions, as minute and strict as to details as when used for laparotomy," adding "I have treated many hundreds of cases of ante flexion in this way, and many times have been alarmed by high temperature, making the threat of septicæmia, and twice have had pelvic abscesses develop."

fully and properly performed, it does good in many ways and helps to secure favorable results in several other operations, as in curetting, trachelorrhaphy, etc. I have dilated the cervix near three hundred times, and in no instance have I had an untoward result, or even a rise of temperature.

But I have been led to query if, after all, "stenosis of the os" is in itself a cause of sterility. I have seen women with a markedly small os, who have borne children, and in a few instances, the os has remained small and virgin-like after several parturitions. Yet a contracted os is more easily obstructed; so dilating, or removing any impediments or obstacles, will make conditions more favorable for conception. Even an accidental plug of mucus may block the passage, as we know that simply passing the sound has in some instances removed a temporary sterility. In like manner, polypoid growths in the cervix may effectually close the canal and be a cause of infertility. One patient had been married eight years and was sterile; I removed from the cervix two small pedunculated mucoid tumors, in ten months thereafter she gave birth to a child. That stenosis is at least unfavorable for conception is proved by the fact that many women who have been sterile for years have, after dilating the cervix, borne several children in quick succession.

II. *Flexions of the Uterus.*—Anteflexion of the body or of the cervix is frequently found associated with stenosis and with an elongated cervix. For the anteflexion, posterior section with anterior incision has effected most remarkable results. It corrects in a degree the deformity, straightens the curve, renders the canal patulous, and thus in many instances the difficulty has been removed.

One of the first patients for whom I performed this operation was Mrs. W—, who consulted me in 1876 for sterility. The cervix was acutely anteflexed, and there was stenosis of both the external and internal os. I made posterior section and anterior incision, under full aseptic precautions, put in the intra-uterine glass stem, tamponed for three days, then introduced the cup-shaped pessary. The patient recovered without a bad symptom, became pregnant a short while after, and in due time I delivered her of a well-formed, vigorous child, and there was no laceration of the cervix.

Some have thought that patients who have had stenosis were more liable to cervix lacerations. But stenosis of the os, when not the outcome of disease, or caustic treatment, is not a cause of, nor does it predispose to, lacerations of the cervix. I have demonstrated by microscopical examination that lacerations occur in those cases where a previous inflammation has transformed portions of smooth muscle-fiber into fibrous connective tissue, which can not expand, and consequently,

during a strong uterine contraction, breaks or tears; hence the laceration.*

It has also been said that a person who has had the operation of cervix incision is liable to abort. This is equally incorrect. The circumstances do not justify the conclusion. I have never known or heard of an instance.

The next patient for whom I operated by posterior section for ante-flexion was Miss R—, in 1878. Her dysmenorrhœa was so severe, and the reflex irritation to the nervous system so great, that her friends and many of her schoolmates thought that her mind was becoming affected. In the treatment of this case I had tried spongetents without good results, so decided to make posterior section of the cervix. This was done under full antiseptic precautions. The patient did well, there was no hemorrhage nor rise of temperature; the dysmenorrhœa was relieved, she was less nervous, and there was a great improvement in her mental condition, so much so, her father said "she was another girl." Not a great while after, this young lady was married, and within a year she gave birth to a child.

Miss S— had an undeveloped, retroverted uterus; the cervix was acutely anteflexed at the internal os, dysmenorrhœa was very severe, and her nervous system and mental condition were morbid. I lifted the uterus in position, and so extreme was the flexion that to straighten the canal it seemed necessary to make posterior section; after which I introduced the intra-uterine glass stem, and subsequently a pessary to hold the organ in position. The patient's sufferings were in a measure relieved and her general health, nervous, and mental conditions were greatly improved. The operation corrected not only the deformity, but stimulated the infantile uterus to healthy action. This young lady married and subsequently had a family.

In 1876 Mrs. W— consulted me in regard to her sterility. She had stenosis of the os, anteflexion of the cervix and suffered with dysmenorrhœa. Posterior incision was made; the second day after, Professor T. G. Thomas saw the patient, he thought the operation very satisfactory, and that it would be followed by the best result. The patient made an excellent recovery without a bad symptom; yet in all the years since, even with the cumulative treatment of other physicians, she has had no children. I am now convinced that her case was complicated with salpingitis, and it was the ulterior cause of her sterility.

The next patient for whom I performed this operation was a woman of eminent social position. Incidentally I mentioned the in-

* Proceedings of the New York Pathological Society, November 9, 1887.

tended operation to Professor B. F. Dawson, of New York; he said he considered the operation exceedingly dangerous, that he knew a woman who was then dying in consequence of it, and had known of several deaths from the same cause. I could not see at the time, nor do I yet, any danger in the operation if it is done aseptically, and if there are no complications, as pyosalpinx, or pelvic abscess. The deaths that have occurred, I believe, have resulted from sepsis, hemorrhage, or co-existing disease of the uterine adnexæ.* The operation was performed for this patient, she had no untoward symptoms, her general health was very much improved, but she remained sterile.

Why in these two cases was the sterility not removed? Each operation was carefully performed, attention given to every detail, and we had reason to expect the best results. If the flexion and the stenosis were the cause of the sterility, after these were corrected why should

* Marion Sims performed this operation several hundred times, and lost but two cases, one on account of pre-existing abscess, the other from hemorrhage. He says further: "I consider the sponge and laminaria-tents more dangerous than the operation." T. A. Emmet says: "It is unquestionably a dangerous operation. I have had to my sorrow pelvic cellulitis with abscesses frequently occur, and death in one instance after the most careful preparatory treatment." Dr. Emmet said on another occasion: "The operative procedure of dividing the cervix with flexure of the body of the uterus is not free from danger, for I have known at least twenty deaths that have occurred in my own practice."

Fordyce Barker says: "Sir James Y. Simpson, who had performed the operation of bilateral section many hundred times, had in one year two deaths from hemorrhage." Dr. Barker adds: "I have several times been called to see patients who, after the operation (cervix incision), were in a very dangerous condition, either from pelvic peritonitis or cellulitis. One who died had not only an accumulation of pus behind the cervix in the recto-vaginal septum, but general pyæmia."

Thomas says, in his large work, page 431: "Should this apparently trifling operation be performed during the existence of periuterine cellulitis or peritonitis the gravest results may follow, and the sufferings of the patient be greatly aggravated. Indeed, had all the fatal cases which have occurred in consequence of this operation been published to the profession, as they should have been, the list would, I think, be a startling one. I, myself, know of five, and have heard of numerous others. My conviction is that the operation, *per se*, is not attended by great danger. It is the performance of it when pelvic peritonitis exists in chronic form that has caused it to produce such bad results."

Dr. White says: "I have used Sir James Y. Simpson's instruments frequently; I did not always cure my patients, I did sometimes kill them."

Dr. Wilson says: "I have operated seventy-five or eighty times. Pelvic cellulitis in one case, and one case of peritonitis which proved fatal."

Dr. Goodell says: "I have had a melancholy result in one instance, the patient died nine days after with pyæmia."

Dr. Howard, of Baltimore, says: "Pelvic cellulitis and peritonitis will follow a certain number of cases, do what you will."

Peaslee says: "Both Sims' and Simpson's methods are dangerous from profuse hemorrhage, pelvic cellulitis, or septic peritonitis, and having a decided tendency to abortion."

the sterility have continued? No doubt in each case there were other and co-existing causes.

Early in 1886, I was consulted by a young woman, Miss T—, who had stenosis and antelexion, with dysmenorrhœa, so that her general health and nervous system were greatly affected. The uterus, thus doubled upon itself, was retroverted. I performed posterior section for correcting the deformity and straightening the canal, and then restored the uterus to position. After the operation Professor Gill Wylie saw the patient, and he thought the best results would be secured; and so it proved, not only by improving the position and condition of the uterus, but principally by favoring the health of the uterine appendages; for, as I have elsewhere stated, antelexion of the uterus tends to develop disease of the uterine adnexæ.

The last time I performed posterior section of the cervix was in 1887. This patient had a similar deformity; and the antelexion had probably caused the oöphoritis, from which followed the enlargement of the ovaries, and their consequent dislocation. Posterior section gave free drainage, and thus prevented the already diseased and dislocated ovaries from becoming more and more affected, and gave them a chance to regain a degree of health.

In every instance that I have performed posterior section of the cervix, the patient has been benefited.* Still I believe, in most cases, dilatation of the cervix will answer the purpose and meet the indications more fully. The drainage promotes the health of the uterus, the adnexæ, and indirectly of the whole system, at the same time tends to relieve an existing sterility.

However, I began now to doubt whether antelexion of the cervix should be classed among the causes of sterility, especially as I had observed patients who had antelexion of the cervix, in some instances very acute, together with stenosis of the os, and yet these patients became pregnant without delay or apparent difficulty. A young married woman who, on account of an exaggeration of both of these conditions, I thought doomed to sterility, in ten months after marriage gave birth to a child, and has had one every eighteen months since, and even now, after five parturitions, there is still an antelexion of the uterus.

Four summers ago an unmarried girl, scarce eighteen years of age, called at my office to know her condition. She had extreme stenosis and acute antelexion of the cervix, and was two months pregnant. The scientifically branded uterus had promptly and successfully done

* Dr. H. P. C. Wilson said before the American Gynecological Society: "I am convinced, after an experience in four hundred cases of posterior section that nothing which I can do can bring so much relief to the patient as this operation" (Gynecological Transactions, 1887).

its full duty, even against the owner's wishes, and to her great dismay. The spermatozoids can climb through devious crevices, successfully **make** their way, and do their work under most unpropitious circumstances.

A short time after seeing the above patient, a young married woman, Mrs. B—, consulted me for sterility. I found flexion of the uterus, stenosis of the os, and there also existed some oöphoritis, catarrhal salpingitis, and a slight displacement of the uterus and of the uterine appendages. I made no section of the cervix, used no sponge-tents, no dilatation, nor divulsion; but, in addition to constitutional treatment, I applied tampons of boro-glyceride and alum. There was great improvement in her general health, the antelexion was corrected, the congestion and inflammation of the uterus were relieved, the neighboring engorged blood-vessels were depleted and stimulated to renewed vigor, and the patient's general health was improved. Soon after she became pregnant, and she has since had three children. Recently a patient came to me from the north of the State. She had been married some years and had no children. The pain at menstrual and intermenstrual periods was so great that she said she often wished herself dead, and considered how she might destroy herself. I gave constitutional and local treatment, dilated the cervix, used tampons, etc. She was very much improved, and a few days before her visit home, I dilated the cervix a second time, swabbed the whole internal surface of the uterus with carbolic acid, remarking to the patient that there might be a possibility of conception. During her stay at home she said that she had not felt so well for years, nor had she had so good an appetite. Some weeks after she returned for a continuation of treatment, and was found to be pregnant. In this case dilatation was as effective as either sponge-tents or posterior section would have been.

Dr. T. G. Thomas says: "An antelexion is always a matter of grave significance," and in his interesting paper before the American Gynecological Society he further stated: "The wearing of heavy skirts forces the abdominal viscera down upon the growing uterus, and corporal flexion results. If the rectum is constantly distended by masses of fecal matter, the neck is sharply pushed forward, and cervical flexion results."

These are golden words. No organ will act as well when laced and misplaced by corsets. We can not begin to realize the vast injury which corsets do women. As I said in an article published in *Health and Home*, April, 1871: "Tight lacing is doing more to undermine the health of American women than any other one thing." The only wonder is that it does not more seriously interfere with the functions of the genital organs and put them more out of position. We marvel that

women can as well stand it. During the late war many of the Zouaves had hernia, simply from wearing tight belts around their waists.

Anteflexion of the cervix, however, in most instances, dates from the beginning of existence, or commences in feebleness of early life. Many who have anteflexed, undeveloped uteri, show the same lack of development in other respects, and frequently have not the vital power to carry on vigorously the ordinary function of sustaining life, much less the added function of maternity. Still we find instances of anteflexion of the uterus accompanying a magnificent physique, as if the latter was developed at the expense of a stunted uterus and a feeble genital organization.

Some gynecologists, in order to avoid the difficulties of flexion or small os, or to get clear of both, amputate the cervix. As one writer remarks: "In many cases posterior section is not sufficient; for these, there is but one resource, viz., amputation of the neck." Dr. Isaac E. Taylor said: "It is certainly to be preferred to the ordinary incision; a greater percentage of pregnancies occur after amputation of the cervix than after the operation of posterior incision." Another physician, equally eminent, says: "I have amputated the cervix a number of times, but conception has not followed in one case."*

Lateral flexion has by many been considered a cause of sterility. This form of flexion is undoubtedly produced by some pelvic inflammation, and the indications are to treat the pelvic trouble. If there is no peritoneal inflammation, then probably dilatation may be of some service.

Retroflexion is a more serious cause of sterility; yet even with retroflexion conception is not impossible, especially in uncomplicated cases. The uterus may be lifted and held in position by a pessary, or, more completely to overcome the difficulty, the round ligament can be shortened, or ventral fixation performed.†

But when there are adhesions and the retroflexed uterus is bound together, and bound to the floor of the pelvis by these adhesions, retroflexion becomes one of the most formidable and incurable causes of infertility; for the adhesions, or pseudo-membranes, are produced by repeated attacks of peritoneal inflammation, which inflammation has doubtless originated from purulent salpingitis of the tubes, a disease

* Gynecological Transactions, 1876.

† Professor Mundé says: "That in some cases when he has shortened the round ligament, pregnancy has followed." He states that he "did ventral fixation for a case of prolapsus, and the patient died, apparently from intestinal obstruction." He adds: "The result in this case took away some of my ardor for the operation; for a woman with prolapsus of the uterus should not be killed by an operation intended for its relief." (*American Journal of Obstetrics*, July, 1890.)

which, probably in every case, has destroyed their physiological functions, and thereby render conception impossible.

Some recommend massage for stretching the adhesions and replacing the uterus, but if the adhesions are entirely removed, and the uterus in normal position, the salpingitis will of itself be a cause of sterility, and will continue to produce repeated attacks of peritonitis, and there will consequently be a reproduction of the adhesions and pseudo-membranes. Massage can not remedy the evil, and might under some circumstances be attended with grave danger, or possibly with fatal results. In 1888, Mrs. O—— called to consult me. She had acute retroflexion of the uterus, and the uterus thus flexed was bound together by adhesions, retroverted and by similar adhesions, or strong pseudo-membranes, was adherent to the floor of the pelvis, while on the right was a fluctuating mass extremely sore and sensitive. I considered her condition dangerous, and advised laparotomy without delay. It was performed soon after. As previously diagnosed, there was an abscess on the right side. This extended into the adjoining aponeurosis and was closely connected with the psoas and iliac muscles, many fibers of which were found in the specimen removed. The anterior wall of the abscess was formed partly by the remains of the tube and the ovary. So great was the destruction from the abscess that the right Fallopian tube was almost gone, only a trace of the caliber could be seen, lined by shallow folds of mucosa on the surface of which were a few vestiges of columnar ciliated epithelia, the flexed uterus and uterine appendages were found in a mass of dense, well organized pseudo-membranes. These were separated or broken, the diseased mass from each side was removed, and the uterus was lifted and stitched to the abdominal wall. The patient made an excellent recovery and is now in good health.*

This case well illustrates the complications which may accompany a retroflexed uterus, bound with pseudo-membranes, and how the anatomical structure and the physiological functions of the uterine annexæ are in such conditions more or less destroyed.

III. *Undeveloped Uteri*.—This is frequently found associated with antelexion. Either the flexion or the lack of development may interfere with the normal functions of the uterus, and both conditions may exist in women of an otherwise splendid physical organization.

As some women do not mature until they are eighteen, instead of twelve or thirteen, years of age, naturally the same difference may be observed in the development of the genital organs; and for the time being this undeveloped or inactive condition may be a cause of sterility. In most instances it is only necessary for these organs to be invigor

* The abdominal fixation soon gave way.

ated,* the complicating disease removed, and the general system strengthened. Treated in this way, I have seen women with undeveloped uteri in time become mothers of large families of children. In 1865 a young married woman consulted me for sterility; the uterus was much below the normal size, ante flexed and accompanied by scant menstruation. I treated her locally and constitutionally; subsequently she became the mother of a number of children.

Along with an undeveloped uterus there may be a lack of development of the ovaries or tubes, such as would be a malformation; yet these organs, even with this disadvantage, may, if healthy, perform their functions. Mrs. S— had given birth to several children; subsequently, on account of disease, the uterine appendages had to be removed, and there was discovered a very anomalous condition of the Fallopian tubes; both were undeveloped and bifurcated up to their union with the uterus.

IV. *Physical Overwork*.—Exhausting labor in men or women may interfere with the efficient action of any organ, as the stomach, lungs, brain, etc.; so when the system of a woman is exhausted by undue manual labor, the nervous power and vital resources used up, there may not be sufficient strength for perfecting the genital organization or for the performance of its functions. Our bodies may be made such machines of toil that not only the higher, but the procreative, powers may show a lack of activity and vigor. I have known strong sturdy women to go through such prolonged labors, such continued herculean tasks, that they had not the capability or delicacy or firmness to perform the function of maternity; or sufficient *human* in them to want children. Such women are “martyrs to labor.”

A German woman who visited the dispensary said: “That from her sixth year she plowed, hoed, cut hay, gathered into the barns,” etc. In moderation these labors might have made her strong and vigorous; they were no more severe or exhausting than much of household work, but continued eighteen hours each day, without sufficient rest or sleep, the life was taken out of the woman, and after a marriage of over twenty-five years she had no children, and at the age of forty-five had still an undeveloped uterus, which was already in a state of cancerous degeneration. Another dispensary patient, a strong Irish woman, with a powerful physique, almost a giant body; yet she had been such a machine of toil, that she had almost lost the fineness of womanly nature, had never been able to bear children, and her insignificant uterus was still small and infantile.

If persons who are extremely overworked and exhausted do have

* Electricity may in some cases be of service.

children, the latter frequently show a lack of power, mental and physical. Farmers, both husband and wife, naturally vigorous and strong, have been so taxed, their vital resources so drained, that there was no vitality left to give vigor to their progeny; and, in more than one instance, I have seen whole families of such children die off before their parents. Also, during pregnancy the vitality and nerve-powers may be so exhausted that there is not sufficient left for the development of the child; on the contrary, feeble women, if there is no constitutional taint, may, while pregnant, so rest and conserve their life forces and strength, that they give birth to comparatively healthy and vigorous children.

V. *Mental Exertion*.—This is given by some as a cause for sterility. How can the evil be remedied?

Dr. H. F. Campbell, in his paper before the American Gynecological Society, 1888, said: "Our female colleges and seminaries are undoubtedly successful in producing women of the highest intellectual type, but may not this modern system of education have perverted their destiny and lessened their chances of maternity?"

Are we then to conclude that developing and improving one part of the body necessarily dwarfs another, or weakens its power and functions? Does the welfare of one organ detract from the capability of another? Does vigorous exercise to expand the lungs weaken and injure other portions of the body? On the contrary, does not making any one part stronger, healthier and better improve the rest and add to the efficiency of the whole? If the roots of a tree are vigorous, will not the branches spread and the leaves bloom more beautifully? In like manner, does not making the lungs stronger, the stomach healthier, or the liver better, improve the whole human body? And will not developing the brain and nervous system give a healthier stimulus, and a better nerve-supply, to all other parts and organs?

Dr. Campbell continues: "The most unfortunate requirement of female education is the time at which it is most actively conducted, namely, from eleven to sixteen years of age, which is the period of sexual development, and of perfecting the organs of reproduction. When the years of sexual development are passed in bodily activity and without mental strain, the reproductive organs are naturally and promptly developed, their functions normally performed, gestation prosperous, parturition easy, and offspring numerous. May we not legitimately conclude that conditions so entirely opposite and adverse as these, in which the adolescent female of the better class must pass the period naturally allotted to sexual development, be considered a potent factor in the arrest of ovarian and uterine development, by diverting the vital forces from the sexual organs at the very time their

exercise is most needed. The infantile uterus and atrophic sterility will be found, I think, most frequently among women who have been subjected to severe laborious and intellectual labor during the period of pubescence than in those of any other class. The prize girl will often fulfill the destiny of a childless woman.”*

If it can be shown that sterility and undeveloped uteri are found proportionately more frequently among educated women, among those who have gone through a collegiate course of study, “those who have been subjected to severe intellectual labor during the period of pubescence,” than among women who have had no intellectual training, and who have passed the period of the development of the sexual organs in bodily activity and without mental strain, then, with some show of reason, we might seriously inquire if “severe and laborious intellectual labor,” during the early periods of life, is not a “potent factor in the arrest of ovarian and uterine development;” whether it does cause “undeveloped uteri” and “atrophic sterility;” and if intellectual labor does “lessen the chances of maternity,” and to that extent “pervert the destinies of women.”

But is this the case? Are “undeveloped uteri” and “atrophic sterility” more frequently found among educated women than among those who have no mental training? And does mental training in girls between the ages of eleven and sixteen tend to prevent the development of the genital organs, and interfere with their functional activity?

In answer to a portion of the question, may we not refer a moment to the long array of names of brilliantly-educated women who have had large families of children?

I was for years a student in the largest and most advanced college for women in this country. The students pursued a collegiate course of study embracing the higher branches of mathematics, the natural sciences, intellectual and moral philosophy, English literature, belles-lettres, etc. Many of the young ladies, besides, had heavy tasks daily in the classical and modern languages. Afterward, as a teacher, I was in the college four years, and, later, two years in another college equally distinguished and equally advanced; and for a number of years I was principal of a young ladies’ seminary of a high grade, which demanded about the same course of study. During this period of thirteen or fourteen years, over three thousand young ladies came under my observation, who, during the period allotted to sexual development, were subjected to continuous “severe and laborious intellectual labor;” yet in all this number, and in all these years, I do not recollect

* *Gynecological Transactions*, 1888, pp. 442-444.

a single one giving any indication that "the reproductive organs were not naturally and promptly developed, and that their functions were not normally performed." The young ladies were under my observation at all hours of the day, yet in all these years, among so many young women, I do not remember one who apparently had any difficulty with the function of menstruation, or suffered so that her studies were in the least interrupted, or that it was necessary to lie in bed, except perhaps in one instance; and this young lady did so at the periods on a few occasions, because she wanted, as I imagined, a chance to read Browning's poems, or write imitations of the same.*

I would have been apt to have noted any sickness, for I was then reading medicine; and besides, during all these years, physiology was one of the branches that I was studying and teaching.

The young ladies who were subjected to these severe intellectual tasks grew healthier and stronger. They had their regular hours for recreation and sleep; still, severe intellectual labor was demanded, equally heavy, as long continued, and for as many years as young gentlemen have at college; yet the young women were not made sterile thereby, nor invalids, nor did they lack in any way perfect development. Most of them afterward married and had large families of children.

I have known the "first honor girl" for many successive years, girls who gave themselves up to the closest and most "laborious intellectual labor," and who, for their greater mental discipline and profounder intellectual attainments, stood first. They were emphatically "women of the highest intellectual type," yet I do not know of any one of them who fulfilled the destiny of a "childless woman." I recollect one, with her pretty, blushing face; she married; children came in quick succession, till her table was surrounded by young and happy faces. Another "first-honor girl," always accustomed to outstripping the members of her class, when married and settled in a large city, was equally successful in outstripping her neighbors in the number of her children.

A "first-honor girl" of another school, a student, a writer and a public speaker, yet is blessed with more than the usual number of children, and has strength to look after these children and after her household affairs, besides doing much outside work in blessing humanity. "She girdeth her loins with strength, and openeth her mouth in wisdom."

A fourth "first-honor girl," who pursued an extensive course of

* This young lady graduated at the college, afterward married, and had number of children.

study, especially severe intellectual labors, was a superior mathematician, a student of five languages; this woman, at the birth of her third child, had been all day actively engaged in some intellectual pursuit, returned at nine in the evening from a walk, and before eleven o'clock all was over. She had no trouble then, before or after. "Gestation was prosperous and parturition easy." So of many of these three thousand and more women who were subjected to the modern system of female education. They suffered in no way from lack of development, and their functions were normally performed.

In the twenty-five years I have practised medicine I have not seen an instance of undeveloped or infantile uterus in a woman with a college training, or who had passed through a regular course of study, except one, and this young woman had, before she commenced her college course, an anteflexed undeveloped uterus. It was so stamped from her birth, and was by no means a consequence of much study, or the result of intellectual labor.

On the contrary, I have seen women who have passed their younger years in bodily activity, with no college education, and a plentiful lack of mental culture, "whose reproductive organs were not naturally developed, nor functions normally performed;" who had "undeveloped, anteflexed uteri, and atrophic sterility." I have seen proportionately more cases of sterility and imperfect development in my dispensary clinics than I have found in my private practice. Many women who come to the clinics are without education, not able even to write their names, yet they have undeveloped, anteflexed uteri, entirely incapable of performing their normal functions.*

Recently an apparently healthy, vigorous woman came to the clinic, inquiring the cause of her infertility; married nine years, and no children. Her mind had never been disciplined by intellectual labor, yet she had an infantile uterus, lying useless on the floor of the pelvis, and toppled by its side were the tubes and ovaries, equally inefficient and equally incapable of performing their functions. Many uneducated girls call at the dispensary suffering from amenorrhœa; thus in early womanhood menstruation is almost *nil*; as one said: "It lasts scarce a day, and one napkin is sufficient for the period." Others come complaining of the most distressing pains in the performance of this function, some giving evidence of arrested ovarian and uterine development, and a large number complaining of sterility produced by almost as many causes. Others again tell of suffering during gestation,

* I have been especially interested in glancing over the books of my Dispensary Clinics in 1833-84-85, to see how many cases of anteflexion and undeveloped uteri are noted and pictured as found in those poor, uneducated women, who had "bodily activity and no mental strain."

and show most serious injuries as a result of "parturitions that were not easy."

Thus in many of these women, who have not been to female seminaries and colleges, or injured by the modern system of education, we "find the reproductive organs not naturally developed, the functions not normally performed, gestation not prosperous, parturition not easy, and offspring not numerous."

One young woman who had not been afflicted with any kind of mental training, yet did not have as much as an undeveloped uterus. There was no uterus, there were no ovaries, no Fallopian tubes, no vagina, and no menstruation.*

I maintain, therefore, that lack of mental discipline or training does not insure or favor more perfect development of the genital apparatus, or more capability in performing its functions: nor does collegiate training or systematic intellectual labor during the period of pubescence, or at any other period, if pursued under proper hygienic conditions, interfere with the development of the genital organs, their power or functions, or lessen the chances of maternity. On the contrary, mental culture and scholastic training tend to a fuller and more perfect development of the whole body, tend to make grander women, mentally and physically, women who are more capable of bearing healthy, vigorous children, and certainly more capable of training them properly.

Mothers who have large families of children, have them, not because of lack of culture and scholastic training during the period of pubescence, but because they have good and well constituted bodies. It is a glorious thing to be well born. Besides, such women generally have full use of all the powers of the body, the organs are not cramped or bound in, nor their normal activity prevented by the cruel trammeling of corsets.

Of course we must admit that excessive brain-work, over-study, and unhealthy habits, are harmful to every vital function, and will make either boys or girls, men or women, sick.†

Rest and a supply of nerve-power is useful at any time and all through life, that the organs may be well nourished, the functions per-

* Professor B. F. Dawson saw this case with me, and had we not been convinced of the absence of all of these organs, we would have considered the question of making an artificial vagina.

† In the past I have written and lectured on health subjects, and one of the most urgent demands I have made to mothers was against school taxation in early childhood. The brain at this tender age can not stand high pressure and stimulation. Children who have no special tasks until they are seven to eight or nine years of age very soon surpass the early prodigies.

formed physiologically, and especially when there is any great intellectual effort to be made.

There is another fact which it is well to consider: Children without mental cultivation, with minds barren of thought, are sometimes apt to have premature sexual excitement and perverted development of these special organs, frequently resulting in weakness and exhaustion of both body and mind.

Again, every gynecologist will bear witness that diseased uterine appendages are found less frequently among educated women in the higher walks of life. To find a large practice in this department one must get their patients principally from the dispensaries or from the uneducated classes.

Diseases such as endothelioma and gyroma, in which the normal structure of the ovaries is more or less destroyed, would seem more likely to occur when the vital forces were used up in other directions. Yet out of twenty or thirty cases of these diseases I have not found a single instance in one who, in younger years, had severe intellectual labor or scholastic training.

If study prevents development, by diverting the vital forces from the sexual organs at the time of their development or at the growing period, will not the same principle apply to boys pursuing a college course? Where is the difference? "Male and female created He them." Woman is subject to the same laws of growth and health as man, and, like him, she is capable of high mental cultivation, and may, at the same time, retain the full power of her procreated organs.

Dr. H. F. Campbell instances the savage, half-civilized Indian and negro women of Southern plantations. There are many Indian women who are sterile, who have anteflexion, and who suffer from consequent infirmities, and who die young on account of complications. Women's physical Paradise is not among the savage or semi-civilized Indians.

As to the negro women on Southern plantations, I was born south of Mason and Dixon's line, and I know that many of the colored women are sterile, many do not have prosperous gestation or easy parturition, nor numerous offspring. It was among these women that Marion Sims was led to study the remedy for vesico-vaginal fistula, proving that parturitions among them were not always "easy" or "prosperous."

Properly educating and training the mind does not render any other organ less capable of performing its normal functions. To insure the highest degree of development both bodily activity and mental culture are essential.

VI. *Misplacement of the Uterus.*—This has in unnumbered instances been a cause of sterility. In many I have placed a Hodges pessary to

correct retroversion, and women who had previously been sterile for years conceived.

More than a dozen years ago a young woman consulted me, suffering locally and in general health, but most grieved that she could not bear children. Her only child, born nine years previously, had died in infancy. I found a deep transverse laceration of the cervix, retroversion of the uterus, and a torn perineum. I replaced the uterus preparatory to repairing the injuries, but before I had an opportunity for so doing the woman became pregnant. In another one, who had extreme prolapsus of the uterus, and for years an acquired sterility, likewise, upon replacing the uterus preparatory for certain plastic operations, pregnancy supervened. I believe the little sagging, or a slight dislocation of the uterus has, in thousands of women, been the cause of prolonged sterility. Still, a misplacement is not always accompanied by infertility. In 1876 a young married woman, Mrs. D—, consulted me. She was then three months pregnant, and the uterus completely retroverted. From her clinical history there was no doubt the retroversion existed before marriage. I replaced the organ, put in a pessary, and she went to full term.

About the same time I had two other patients with similar conditions, both of whom were in the fourth month of pregnancy, and both had extreme retroversion of the uterus. Fearing that, in replacing the uterus, there might be some untoward accident, I requested Dr. Z. Emery to be present, and he was in each instance. Both patients did well and went on to full term.

In 1881, Mrs. M—, then in the fourth month of her ninth pregnancy, consulted me. She had complete retroversion of the uterus, and a deep transverse laceration of the cervix.* I replaced the organ, put in a "Thomas Cutter,"* and five months after delivered her of a healthy male child.† No doubt the conception occurred while the uterus was in malposition. The long-existing laceration had prevented involution, and produced increased hyperplasia of the uterus, which caused the persistent misplacement.

A yet more extreme case, Mrs. C—, came from a neighboring town; said that she supposed herself five months pregnant, but was in no way increased in size. The enlarged uterus was retroverted and impacted in the pelvis. I informed the patient that it must be lifted into position, but in doing which the life of the child would necessarily

* This pessary is especially serviceable when there is no perineum.

† A few months after, viz., February 8, 1882, I repaired the cervix of this patient. March 8th of the same year I restored the perineum, Dr. Annie Brown and Dr. Harriet Pillsbury were present at each operation, one administering the ether, the other holding the speculum. Dr. Charles N. D. Jones assisted in both operations.

be imperilled; that I would not attempt to replace the organ in my office, but the next day would visit her in her home. This I did.* The uterus at first seemed firmly fixed and impacted, but by careful manipulation it was moved and gradually restored to position, and pregnancy went on to term. No doubt conception occurred while the uterus was misplaced.

VII. *Lacerated Cervix*.—This may be a cause of sterility, first, from the resulting inflammation and change of the cervical and uterine mucous membrane; second, from a weakened, relaxed and hypertrophied state of the whole organ. By repairing the laceration the uterus is made healthier, and thereby sterility may be cured.†

Mrs. A—consulted me in 1882, being a sufferer locally and in general health, and had an acquired sterility of some eight or ten years' duration. There was an extreme bilateral laceration of the cervix, lips everted, and the mucous membrane covered with small erosions, some portions of which were in a state of deep ulceration, bleeding at the slightest touch. May, 1882, I repaired the laceration.‡ The patient made an excellent recovery, and after the operation the uterus presented an entirely normal appearance. The patient's health was very greatly improved, and subsequently she had one or more children. Thus repairing a lacerated cervix, when there is no pelvic trouble, improves the general health, prevents untoward results, and in unnumbered instances has removed an acquired sterility.

A writer in the *American Journal of Obstetrics* in January, 1883, says: "I have endeavored to collect all the cases where, after this operation, conception took place; fancy my astonishment to find throughout all the literature of the Surgeon-General's office, touching this particular point, eleven cases only recorded."

* I had clearly in my mind the case mentioned by Montgomery, where a woman had died in this condition, and after death the pregnant uterus was found so wedged in that the pelvic bones had to be sawn asunder before it could be lifted.

† Dr. Joseph Price, in his timely and able article published in the *Buffalo Medical and Surgical Journal* of November, 1890, shows how major pelvic troubles are often traceable to minor gynecological operations. Any minor operations of the cervix, if not done aseptically, may result in serious pelvic trouble. When the operation of restoring a lacerated cervix is performed a patient should recover in eight or ten days, and she will if there is no sepsis. If she does not, and if, as in some instances, she is sick for weeks in consequence of the operation, mischief is done, or, in the emphatic words of Dr. Price, "the person is made distinctly worse by operative interference." I have in delicate women cut from the cervix large portions of diseased tissue, brought together the great flaps, and in a week the wound was entirely healed and the patient comfortable. Dr. Price wisely reminds us that when there is pre-existing disease of the pelvis no cervical operation should be attempted.

‡ Dr. C. N. D. Jones assisted. Dr. Samuel King administered the ether, and Dr. Josephine Dupre held the speculum.

I think if the doctor will examine every-day life and practice, he will find unnumbered instances of conception following trachelorrhaphy, and due to the good results of the operation. When it is properly performed the uterus becomes more healthy, and consequently more capable of performing its functions. In 1883 I restored for a patient, Mrs. C——, in the Woman's Hospital and Dispensary, a deep transverse laceration of the cervix; subsequently she had a number of children. Mrs. R—— was a patient in the same hospital, had a similar laceration, and was sick and suffering in her general condition. If the injury had not been repaired she would have continued to be sick, having constantly more or less distress, and would have remained sterile. The operation was advised, not however on account of sterility, but because of her local suffering and enfeebled health. She made an excellent recovery, and afterward had five children. Mrs. McG——, in the same hospital, had also a deep transverse laceration of the cervix, which was restored with equally good results.* A few weeks after, when I repaired the perineum of this same patient, in June, 1883, Dr. J. H. H. Burge, Dr. F. W. Rockwell and Dr. Colton were present, and had an opportunity of seeing the already restored lacerated cervix; as one of them remarked, "the result was perfect." After the operation the patient's health was very much improved, and subsequently she had several children.

In 1884 Mrs. D——, from a neighboring city, consulted me for sterility and pain. Thirteen years previously she had had a child, at which time occurred a deep transverse laceration of the cervix. I repaired this injury,† and the patient has subsequently given birth to five children. Many such instances I could narrate. One of the most interesting of the kind was a friend of the last-named patient. Her only child, born five years previously, had died in infancy. I found an extreme laceration of the cervix, on one side, extending past the vaginal junction. The operation of trachelorrhaphy was performed, and in less than a year the patient gave birth to a child, and has had five children since. In 1885 Mrs. C—— was a patient in my private hospital; she was in a very depressed state of health, and had a deep transverse laceration of the cervix. I restored this laceration in the presence of several physicians, who were at that time attending the New York Polyclinic. The operation was successful in every respect.

Mrs. Y——, suffering from a similar condition, was, in 1888, operated on in the Woman's Hospital of Brooklyn, and the only reason

* In the last three operations ether was administered by Dr. A. H. P. Leuf, Dr. C. N. D. Jones assisted in the operation, and Dr. E. J. C. Minard was present.

† Dr. Conway and Dr. C. N. D. Jones were present and assisted.

why she wanted the operation was to remove an acquired sterility of nine years' duration. So, many instances could be given where the operation has resulted satisfactorily in this respect, and probably it would in every one, if there were not other and pre-existing causes of sterility. Consequently there will sometimes be a disappointing result.

In 1876 I performed this operation for Mrs. L—, on account of acquired sterility of some years' duration. Dr. C. N. D. Jones assisted. Dr. Z. Emery administered the ether. The patient was young, and in some respects seemed to be a favorable case, but the sterility was not removed, because, as I now know, there was tubal disease. So another patient, Mrs. Y—, had an acquired sterility of nine years. The lacerated cervix was repaired, but the sterility continued.*

While a lacerated cervix is often a cause of infertility, still we know it is a fact that some women are exceedingly fruitful who have laceration of the cervix to such a degree that it is a question whether there is sufficient vantage ground to hold the foetus. A patient consulted me who had an extreme bilateral laceration, yet had nineteen children, and evidently the laceration had been existing some years. Another woman, who had an old laceration, had fourteen children; another sixteen, and one woman had a similar deep bilateral laceration of the cervix, and was then pregnant with her thirteenth child. Though a laceration in these cases did not cause sterility, yet it was a cause of suffering locally and constitutionally, and in depressed states of the system it may be a cause, and become the seat of a malignant growth. Attention was drawn to this fact more than twenty years ago by Dr. T. A. Emmet.

VIII. *A Lacerated Perineum*.—A lacerated perineum is frequently a cause of sterility, by producing more or less displacement of the uterus and the uterine appendages, and consequent disease and functional disturbance. Repairing the injury has in many instances restored the organs to a proper position, and enabled them more fully to perform their physiological functions.

IX. *Fungoid Growths*.—When these exist we find the mucous membrane thickened, the utricular glands diseased, and consequently the uterus can not as well perform its normal functions; besides which, the repeated hemorrhages may be a cause of sterility by preventing the fixation of the ovum.

Mrs. H—, after the birth of two children, had become sterile. The frequency and duration of menstruation continued to increase until she had well-pronounced menorrhagia, and finally it became a

* Dr. Carey administered the ether; Dr. J. H. H. Burge and Dr. C. N. D. Jones assisted.

dangerous hemorrhage. I curetted the uterus, removed a large amount of fungoid tissue—the hyperplastic mucosa—after which the menstrual flow was normal, and in two months the patient conceived.

In Sept., 1887, Mrs. S—— was brought to the Woman's Hospital of Brooklyn in an almost dying condition, perfectly ensanguinated, lips blanched and pulse rapid. She was forty years of age, and had been sterile for a number of years. That evening, after attending to a number of patients, I was about leaving the hospital, then past ten o'clock, when seeing the woman in apparently so dangerous a condition, I did not consider it safe to leave her until the next morning, so had her placed upon the table, curetted fully the whole internal surface of the uterus, and swabbed it out with pure carbolic acid. The patient had no more hemorrhage, gained strength rapidly, and, I understood, a month or so after leaving the hospital, she conceived.

In the fall of 1875 I had a similar case of long-existing sterility with hyperplastic mucosa; finally the patient was taken with profuse and apparently dangerous hemorrhage. I requested Dr. Louis Pilcher, of Brooklyn, to see the patient with me; said to him that I thought it was fungoid growths, and that they should be removed; and thereby the hemorrhage stopped. But so aggravated was the patient's condition that Dr. Pilcher judged it was cancer, and that "the history of the case would be repeated hemorrhages until she died." The hemorrhages becoming more dangerous, I requested Dr. T. G. Thomas, of New York, to see the patient. He came Sunday at an unexpected hour, when it was impossible for me to notify Dr. Pilcher. He diagnosed fungoid growths, and at my request removed them. The patient recovered, and is still in good health.

X. Diseased Ova.—I have not yet seen the condition of the ova mentioned as a cause of sterility, yet it is a serious and frequent cause, and no doubt is the secret why, in many instances, well-directed efforts to cure sterility have been unavailing. I have been surprised, in studying the morbid anatomy of the ovaries, to find how frequently the ova are diseased and abnormally changed. I first recognized the condition in the ovaries of a patient who consulted me in 1887. She was twenty-seven years of age, had been married six years, and had no children. The patient was sad and broken-hearted, not so much because her health was wretched, that she was emaciated, pale and cadaverous, suffering pain, and not able to work, or attend to her household duties, but because she could not have children. She had had excellent medical treatment by many physicians, was no better, but rather grew worse. There was serious disease of the ovaries, manifestly some unusual form of degeneration, so that it was not a question of having

children, but of saving the woman's life, and trying to restore her to some degree of health. I informed the mother and husband that I did not believe anything would cure the patient or prolong her life but the removal of the diseased structures, which evidently were becoming more and more seriously affected. These were removed, the patient made a good recovery, and afterward, by microscopical examination, it was verified that almost the entire stroma of both ovaries was destroyed by a growth—endotheliomatous—and the ova were found in various forms of degeneration. Some were filled with medullary corpuscles, without a trace of the yolk, or the macula germinativa; in others the macula germinativa and the vesicular germinativa were broken down into granular matter, and the few epithelia that remained were enormously swollen or contained fat granules. In others, again, the work of destruction was still farther advanced by the yolk being changed to fibrous connective tissue. In many places the only remains of an ovum, or of closely packed groups of ova, were clusters of inflammatory corpuscles, changing to fibrous connective tissue.

The ova showing these various stages of a retrograde process were in the midst of newly-formed myxomatous tissue, which was again taking on a new inflammation, or changing to inflammatory corpuscles, other portions to fibrous connective tissue. What was more striking still, many of the ova were being penetrated by the newly-formed myxomatous tissue, and soon there would have been left not a vestige of the original ova.

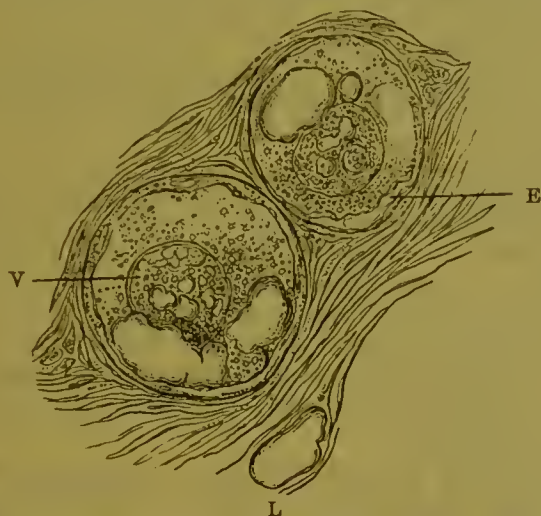
The indications were that this woman, but for the changes in the ova, would, before the more serious advance of the disease, have been capable of bearing children.

Diseased ova were next found in a patient who had pyosalpinx, and who, during her whole nine years of married life, was sterile. Apart from the salpingitis, the condition of the ova would have been a sufficient cause of infertility. Some of them were in a state of intense acute inflammation, some were in fatty degeneration, shrivelled, or so atrophied that there was not one anatomical element of the original ova to be found. In one field of the microscope I counted as many as fifty, all shrivelled and partly waxy. No treatment or medication could have brought these ova back to health or normal activity, consequently, even apart from the salpingitis, nothing could have cured the patient's sterility.

It may here be remarked that while sections from some ovaries exhibited an almost entire destruction of the ova, sections from other ovaries, which were in some respects equally diseased, did not contain a single abnormal ovum. How or why these interesting organisms

should become affected is not understood.* They are frequently so found in comparatively young women ; so in early life must commence some of the causes which bring this terrible after-harvest of diseased ova, sterility and ill-health.

Mrs. A—— and Mrs. F——, both young women, both sterile, both had diseased tubes, and the ovaries of each contained ova in colloid degeneration. In some the yolk, the germinativa and the epithelia were



Colloid Degeneration of Ova. $\times 600$. V, Vesicula germinativa, with small colloid lumps ; E, epithelium in colloid degeneration ; L, colloid lump in the muscle-layers of the ovary.

transformed into colloid corpuscles. In others the entire center of the ova was a colloid mass.

Such colloid lumps as L (see illustration) were found in great numbers in the muscular fibers, cyst-walls, invading the ova, and even scattered among the pigmented corpuscles of a recent menstrual follicle. They must be of some significance, or a cause of disturbance, as all the women in whose ovaries they were found had a history of suffering, and most of them were sterile.

Mrs. X—— when first married was strong and in perfect health, had two children, since which time for more than ten years she has been sterile, suffering locally and constitutionally from disease of the uterine appendages, also by reflex irritation her mental conditions were at times disturbed. The ovaries and tubes on both sides were enlarged,

* I am still pursuing my microscopical investigations to understand the etiology and pathology of diseased ova.

sore, sensitive and prolapsed in Douglas cul-de-sac. They were removed, and subsequent microscopical examination showed that there was subacute oöphoritis, and the ova were found in all stages of inflammatory action, many advanced to waxy degeneration. In one follicle there were four ova, and all waxy.

Another patient who had been sterile for years, and although the ovary was almost entirely destroyed by an endotheliomatous growth, yet at one period it was the diseased ova that caused the sterility.

XI. Disease of the Ovaries.—In disease of these organs we find many and varied causes of infertility. Besides abnormal ova we have acute, subacute, chronic and interstitial oöphoritis, benign and malignant growths, and, as an outcome of previous existing disease, dislocation of the ovaries.

Acute, subacute, chronic or interstitial oöphoritis, when intense, will change any and every structure of the ovary; the smooth muscles will be transformed into fibrous connective tissue, producing more or less cirrhosis of the organ, which necessarily interferes with the functions and consequently will be a cause of sterility.

In the normal ovary there is a vast amount of muscle-tissue,* placed there for some purpose, possibly to help in maturing the follicles of De Graaf, or to help their growth toward the surface, or to help in the extrusion of the ova.

Another cause of sterility is benign or malignant growths in the ovary; they destroy the normal structure, or produce more or less displacement of the organ, and thereby its natural relations with the tubes are lost.

* Many standard and well-known authors do not mention the presence of muscles in the ovaries. Prof. J. C. Dalton, in his well-known Physiology, says: "The ovary is comparatively simple, consisting only of Graafian follicles united by connective tissue. On page 590, seventh edition, 1882, he says: "In the human species, the ovaries consist of Graafian follicles, imbedded in a somewhat dense connective tissue, supplied with blood vessels, and covered with an opaque, yellowish white layer of fibrous tissue, called the albuginous tunic." The American System of Obstetrics, vol. i., p. 68, says: "The adult ovaries are dense, fibroid, ovoid masses. The stroma consists fundamentally of a close felt-work of hard, fibrous, and yellow elastic connective tissue richly supplied with muscle-corpuscles." Another writer refers to "the much-vexed question as to whether smooth muscle-fibers do or do not exist in the normal ovary." Without doubt in the normal ovary there is much smooth muscle-fibers, in the cortex especially, where the muscle-bundles gracefully wind and intertwine in wonderful complexity; nor are they, according to His, "stunted muscular fibers." Can we regard the ovary as "comparatively simple" in its structure? Is it not rather a complex organization with a great variety of tissues? As Dr. H. C. Coe, in his erudite article on "Fibromata of the Ovary," published in the American Journal of Obstetrics, July, 1882, says, it is "an organ which abounds in inexplicable things—anomalous appearances so frequently encountered, at whose pathological import we can merely guess."

Dislocation of the ovary is also a cause of sterility, as it prevents the easy co-adaptation of the ovary with the tubes. But as the dislocation most frequently results from oöphoritis, or the consequent hyperplasia, or from abnormal growths, these are really the cause of the functional incapability.

A more serious cause of sterility is the formation of pseudo-membranes covering the surface of the ovary, as illustrated in Fig. 5, in "Microscopical Studies in Peritonitis." Such pseudo-membranes, or dense fibrous connective tissue, result from salpingitis, oöphoritis, or local peritonitis, and will prevent the exit of the ova from the ovary. These little organisms, of microscopic smallness, carrying their wonderful load of living matter with its vast capabilities and powers of growth, when they start on their perilous journey from the ovary to the tubes, may meet with yet greater difficulties, even insurmountable obstacles in the dense membranes that may envelop, bind down and close the tubes; thus, many of these little creations, these marvellous masses of living matter, are lost and perish.

Schroeder speaks of "the external migration of the egg;" that is, its passage from one ovary to the tube of the opposite side. But can the ova make the supposed journey? Have they any way of locomotion or means of progress? If it takes ten or fifteen days for one to pass through the Fallopian tubes, it would be months in making such a voyage as this, a voyage so full of pitfalls and so perilous that scarcely a single ovum would ever arrive safely at the end of its Don Quixote expedition.

Is it not more likely that the countless millions of cilia in the tubes create a current sufficiently strong to draw the egg into its pavilion, or into the fimbriated extremity of one tube or the other; and then by peristaltic action of the tubes the egg is floated or blown along. Or, probably, the Fallopian tubes, with their wonderful muscular structure and marvellous capability of motion, may fix themselves first upon one ovary then upon the other, so that an egg from one side will pass through the tube on the opposite. This is not improbable, and may explain what is supposed to be the "external migration of the egg." The Fallopian tubes have wonderfully thick layers of muscles, both longitudinal and transverse—a richer supply than have the walls of the alimentary canal. It has been demonstrated* that they have in their walls five layers of muscles instead of three, the number usually given by anatomists. So the Fallopian tubes are capable of varied and extensive movements, and either one may fix itself upon the ovary of the opposite side.

* In Dr. Heltzman's laboratory.

Of all causes of sterility the *diseases of the Fallopian tubes* are by far the most frequent and the most serious. The health of no organ is more essential to fertility. The uterus may be lacerated, ulcerated, anteflexed, retroflexed, enlarged, displaced, cancerous, or the seat of fibromatous growths, yet, if the Fallopian tubes are healthy, conception is possible. The ovaries may be dislocated, and the seat of varied forms of degeneration, the woman hysterical, have painful menstruation and pelvic pains, yet if the carriers of the egg are healthy all may be well. I have seen a healthy ovum in the midst of a sea of ovarian disease; such an ovum, if the tubes are all right, may accomplish its full destination. But when the tubes are diseased, the mucosa thickened, swollen, or converted into masses of inflammatory corpuscles, the walls changed, its muscular structure destroyed, the fimbriated extremity closed, and possibly the whole tube converted into an abscess, then the tubes are no longer capable of performing their functions. They are physiologically dead. The woman is *completely and forever sterile*. As well talk of one who is stone-blind seeing the fine colors of the rainbow.

XII. Cause of Infertility. Hopeless Disease of the Uterine Appendages on One Side, and Sterility Cured by their Removal.—One often observes in performing laparotomy that the uterine appendages in one side are much more profoundly diseased than those on the opposite, also, unmistakable evidence that the disease has existed a longer period; indeed, those on one side may be almost normal, while those on the opposite may be so profoundly diseased as to be incapable of cure or functional activity.

It is also a fact, that if one set is seriously affected, this disturbance will not only interfere with and probably prevent the more healthy ones from performing their functions, but will, sooner or later, involve them in similar conditions, consequently, removing the more diseased organs will give the others a chance of becoming healthier, more vigorous and more capable of accomplishing their special duties; and thus, a woman who would otherwise remain sterile, may, by this operation, be enabled to bear children. So oöphorectomy and salpingectomy will in some instances cure sterility.

Mrs. K— came to the dispensary of the Woman's Hospital suffering in general health, pain in the pelvis, and evident disease of the uterine appendages, and was sterile.

The uterine appendages on one side were much more diseased than on the opposite. We judged by removing the more diseased organs the less diseased would grow more healthy, and, for a while at least, be able to perform their functions. The operation was performed April 16, 1889, by Dr. Charles N. D. Jones. The patient made an excellent recovery, and was continued under special treatment till June 26th of

the same year, when she left the hospital. On June 20, 1890, she was delivered of a healthy female child. August 3, 1891, she was delivered of a second child, and without any indications of strain on the abdominal walls. This child was a male, proving, at least, that the ovary does not decide the sex. The patient is still in excellent health, with probabilities of having several more children.*

If the uterine appendages which were diseased had not been removed, they would in time have affected those on the opposite side, and thereby hopeless sterility would have ensued. By the operation the patient was relieved of pain, restored to health and made fruitful.

The advantage of a unilateral operation, as to fruitfulness, is often illustrated in the removal of a cystoma, after which, as repeatedly proved by clinical experience, a woman who was previously sterile, is capable of becoming pregnant.

Conclusion.—Sterility results from disease or defective formation, the indications are to cure the disease and correct the defects.

* An instance is given of a woman who had the uterine appendages only on one side, yet she had nine children. I have counted in one microscopical section of an ovary seventy-three good ova.

